~~signature of pathogens (R.G. Pinnick, *et al.*, "Real-time measurement of fluorescence spectra from single airborne biological particles", *Field Anat. Chem. Technol.* 3, 221 (1999); Scully et al., "FAST CARS: Engineering a laser spectroscopic technique for a rapid identification of bacterial spores". PNAS, 99, 10994, (2002)).~~

~~The invention provides a novel methodology that overcomes limitations of the conventional fluorescence sensoring. To increase the fluorescence intensity, we will employ the effect of enhanced fluorophore absorption/emission rates by *surface plasmon resonance* (SPR) of nearby metal (silver, gold) nanoparticles (M. Kerker, "Optics of colloid silver", *J. Colloid Interface Sci.* 105, 298 (1985); Lakowicz et al, "Intrinsic fluorescence from DNA can be enhanced by metallic particles", *Biochem. Biophys. Res. Comm.* 286, 875 (2001); Gryczynski et al., "Multiphoton excitation of fluorescence near metallic particles: enhanced and localized excitation", *J. Phys. Chem. B*, 106, 2191 (2002)). When the fluorophore is in a direct contact with a metal nanoparticle, fluorescence is completely quenched by energy transfer to metal. However, at the distance of 10 nm – 100s nm between the fluorophore and metal nanoparticle the absorption and emission rates can be, respectively, enhanced by factors of ~10^2 and ~10^3 [11]. The enhancement of the emission intensity depends on fluorescence quantum yield Q, where $0 \le Q \le 1$.~~

The invention provides a novel sensor and a novel methodology that overcomes limitations of the conventional fluorescence sensing. ~~It is the first~~ The invention ~~that~~ implements a measurement of plasmon enhanced multi-band fluorescence for analyte identification in fluorescence sensing. Current fluorescence ~~sensors~~ sensing ~~are~~ is based on a measurement of a single-band fluorescence,